

REMARKS

Applicants appreciate the thoroughness of the Examiner's office action and have endeavored to place the application in condition for allowance with the amendments above and the remarks below.

In the Claims

Claim 7 is objected to because of the misspelling of "ethylene". The typographical error has been corrected and, as such, the objection should be withdrawn.

Claim 1 has been amended to further distinguish the independence of the first and second alkyl acrylate, and the first and second monoethylenically unsaturated polar copolymerizable monomer. Support for this amendment may be found in the specification on pages 10 to 11, paragraph 34; page 11, paragraphs 36, and 37; page 13, paragraph 42; page 14, paragraph 47; page 15, paragraph 50; and page 18, paragraph 58. In all instances cited, the first and second alkyl acrylates are independent of each other and are not the same material. In all instances cited, the first and second monoethylenically unsaturated polar copolymerizable monomers are independent of each other and are not the same material.

New claims 41 and 42 are fully supported in the specification in Figure 1.

The undersigned avers that no new matter has been added.

Section 103 Rejections

Claims 1 through 8, 10 through 14, 16, and 18 are rejected under 35 U.S.C. §103(a) as allegedly being obvious in view of U.S. Patent No. 5,308,887 to Ko et al. Ko et al. teaches a radiation curable pressure sensitive adhesive (PSA) tape which includes a foam backing comprising about 80 parts to about 99 parts of an alkyl acrylate monomer, and correspondingly, about 20 parts to about 1 part of a copolymerizable modifier monomer. The foam layer may further include a gas and/or microspheres, and fillers. The foam backing of Ko et al. is used in conjunction with a hybrid acrylate/silicone PSA.

In paragraph 4 of the Office Action, the Examiner appears to have mistakenly stated that the foam layer includes two different acrylic monomers and two different copolymerization modifier monomers. The Examiner also maintains the position that the claims do not require the first and second monomers to be different.

In column 14, lines 26 through 32, the acrylic monomers of the foam layer in Ko et al. are stated to be similar or dissimilar from those acrylic copolymers contained in the adhesive layer comprising the adhesive of the Ko et al. invention. Additives to the acrylic monomers of the foam layer may also be the same or different from those contained in the adhesive layer. In the specification and examples, there is no teaching or suggestion that the acrylic monomers of the foam layer be a mixture or comprise more than one monomer as in the present invention.

Applicants have also amended claim 1 to distinctly point out that the first and second alkyl acrylates are independent of each other, as well as to point out the independence of the first and second monoethylenically unsaturated polar copolymerizable monomers. Also, Applicants again emphasize that Applicants are not trying to form an acrylic adhesive, but rather to form an acrylic foam-like backing (that is a backing having evenly interspersed hollow glass microspheres therein) with a conventional pressure sensitive adhesive applied to at least one surface thereof. Thus, Ko et al. does not render the present invention obvious. The rejection under §103 should be withdrawn and claims 1 through 8, 10 through 14, 16, and 18 pass to issuance.

Claims 9 and 15 are rejected under 35 U.S.C. §103(a) as allegedly being obvious in view of Ko et al. in combination with U.S. Patent No. 3,565,247 to Brochman. Ko et al. is as discussed above. Brochman teaches a PSA tape product with a foamed layer formed by a blowing agent and a nucleating-reinforcing agent such as fumed silica. The Examiner asserts that the use of fumed silica found in Brochman would be obvious to obtain effective foaming of the composition of the present invention.

Contrary to Brochman, the present invention does not provide for a PSA tape having a foamed adhesive composition but rather is directed to a foam-like backing which has discrete voids due to the dispersion of the hollow glass microspheres as a substrate for an adhesive. A surface analysis was performed on the foam-like backing via a scanning electron microscope analysis, as discussed in the provisional patent

application from which the present application claims priority. (See provisional application No. 60/216,733.) Fig. 2 of the provisional application, provided with the Amendment dated February 13, 2002, (Paper No. 7), shows a photocopy of a cross sectional photo taken at a magnification of 200x. The round areas shown are the result of broken hollow microspheres. In the majority of samples tested no voids are evident. Furthermore, the recovery of the Brochman tape product is quite low, less than 5% recovery in thickness when compressed to half its original thickness. The percent recovery after compression of the foam-like backing of the present invention, as shown in Figure 1, is greater than 96.5% when the backing is compressed to about 15%. Brochman teaches away from the present invention in that the tape products made accordingly thereof readily conform to uneven surfaces due to the collapse of microcells in the foamed adhesive layer, unlike the resilient foam-like backing of the present invention.

Thus, claims 9 and 15 are not rendered obvious in view of Brochman alone or in combination with Ko et al. and should pass to issuance.

Claims 17 and 20 are rejected under 35 U.S.C. §103(a) as allegedly being obvious in view of Ko et al. in combination with U.S. Patent No. 5,264,278 to Mazurek et al. Ko et al. was discussed above. Mazurek et al. teaches a hybrid PSA tape product comprising a pressure sensitive layer comprising a silicone, a polymerizable vinyl monomer, a silicate tackifying resin, and a foam layer. The Examiner contends that it is obvious to incorporate 1,4-butane diol diacrylate into the foam composition motivated by the desire to crosslink the acrylic phase to improve the internal strength of the foam composition.

Applicants respectfully submit that the Mazurek et al. reference does not teach or suggest that 1,4-butane diol diacrylate is used to crosslink the acrylic monomer in the foam backing (see column 11, lines 20 to 23), but rather is used to crosslink the hybrid PSA system to control the PSA properties. Nor does Mazurek et al. teach or suggest that the acrylic monomers of the foam layer be a mixture or comprise more than one monomer as in the present invention (see column 13, lines 38 to 43).

Thus, claims 17 and 20 are not rendered obvious by Mazurek et al., alone or in combination with Ko et al. and, as such, the claims should pass to issuance.

Claim 19 is rejected under 35 U.S.C. §103(a) as being obvious in view of Ko et al., in combination with Mazurek et al. and Brochman. In light of the discussion of the references above, individually and in combination, Applicants respectfully submit that Ko et al., Mazurek et al., and Brochman do not render the present invention obvious. Ko et al. does not teach or suggest an acrylic foam-like backing having first and second alkyl acrylate monomers, and first and second monoethylenically unsaturated polar copolymerizable monomers. Mazurek et al. does not teach or suggest that 1,4-butane diol diacrylate is used to crosslink the acrylic monomer in a foam-like backing but rather in the PSA. Brochman does not teach or suggest a foam-like backing having a degree of recovery after compression; rather Brochman teaches away from the present invention in that the tape products made accordingly thereof readily conform to uneven surfaces due to the collapse of microcells in the foamed adhesive layer, unlike the resilient foam-like backing of the present invention.

Thus, claim 19 is not rendered obvious by Ko et al., Mazurek et al., and Brochman, alone or in combination, and should pass to issuance.

For reasons given above, applicants submit that the claims of the instant application are in condition for allowance. Reconsideration of the rejection and allowance of claims 1 through 20, 41, and 42 are respectfully requested. Please charge any underpayment or credit any overpayment to Deposit Account No. 13-0235. Any matters which may be handled by telephone should be directed to the undersigned at 860-549-5290.

Respectfully submitted,

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Version with Markings to Show Changes Made

A marked-up version of the amendments are shown below showing additions with underlining and deletions with strikeout.

In the Claims:

The replacement Claims 1 and 7 are as follows:

1. (Twice Amended) An acrylic pressure-sensitive adhesive tape comprising:
 - (a) a layer of an acrylic backing comprising
 - (i) from about 88% to about 92% of an acrylic polymer comprising:
from about 35% to about 45% of a first alkyl acrylate monomer having alkyl groups which contain from 4 to 12 carbon atoms,
from about 30% to about 40% of a second alkyl acrylate monomer having alkyl groups which contain from 4 to 12 carbon atoms, wherein said second alkyl acrylate monomer is independent from said first alkyl acrylate monomer,
from about 6% to about 10% of a first monoethylenically unsaturated polar copolymerizable monomer, and
from about 1% to about 2% of a second monoethylenically unsaturated polar copolymerizable monomer, wherein said second monoethylenically unsaturated polar copolymerizable monomer is independent from said first monoethylenically unsaturated polar copolymerizable monomer; and
 - (ii) from about 8% to about 12% of hollow glass microspheres dispersed evenly in said polymer; and
 - (b) at least one layer of a pressure-sensitive adhesive.

7. (Twice Amended) The acrylic pressure-sensitive adhesive tape according to claim 4, wherein:

the crosslinker/chain extender is taken from the group consisting of [ethylene] ethylene glycol diacrylate, triethylene glycol diacrylate, 1,4-butanediol diacrylate, 1,6-hexanediol diacrylate, trimethylolpropane triacrylate, pentaerythritol triacrylate, tetraethylene glycol diacrylate, [and] methacrylates, and combinations thereof.